

A47 Blofield to North Burlingham Dualling

Scheme Number: TR010040

Volume 6

6.2 Environmental Statement Appendices

Appendix 11.5 – Construction Noise Assessment

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed
Forms and Procedure) Regulations 2009

December 2020

Infrastructure Planning

Planning Act 2008

**The Infrastructure Planning
(Applications: Prescribed Forms and
Procedure) Regulations 2009**

A47 Blofield to North Burlingham
Development Consent Order 202[x]

ENVIRONMENTAL STATEMENT APPENDICES
Appendix 11.5 Construction Noise Assessment

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Author:	A47 Blofield to North Burlingham Dualling Project Team, Highways England

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11.1. Construction phases used to inform the assessment

11.1.1. Details of each construction activity have not been provided by the Contractor at this stage. However, indicative construction phases have been outlined and are shown in Figure 2.1 (TR010040/APP/6.3). The assumed most relevant activities in terms of potential noise impact during each phase are presented in Table 11-1 below.

Table 11-1: Outline Construction Phases

Construction Phase	Description	Assumed noisy activities*
Site Compound and works access	Set up of construction compounds. One main site compound and two satellite compounds.	Earthworks Surfacing
Phase 1	Offline construction. Main carriageway, structures and any remaining utility works August 2022 to July 2023 Predominantly daytime works. Overnights to construct works accesses.	Earthworks Road Formation Structures Surfacing
Phase 2	Offline construction and Hemblington Rd /Yarmouth Rd link. Construct the new Hemblington Link Road. November 2022 to February 2023. Predominantly daytime works, Overnights / 24 hour weekends required to complete Hemblington Road tie ins.	Earthworks Road Formation Surfacing
Phase 3	Offline construction continues – Traffic using new Hemblington Link Road and construct further section of new carriageway. February 2023 to July 2023. Predominantly daytime works, overnights if required.	Earthworks Road Formation Surfacing
Phase 4	Offline construction continues. Construct cross-overs either end of existing east bound dual carriageway. Small sections of contraflow used to enable new west bound carriageway to tie-in to existing A47. Traffic to remain on existing single carriageway. June 2023 to July 2023 Predominantly daytime works, Overnights required to construct A47 cross-overs.	Surfacing
Phase 5	Weekend / overnight closures (as required) to finalise tie-in to new west bound dual carriageway July 2023. Daytime works, overnights / 24 hour weekends required to complete A47 tie ins.	Road Formation Surfacing
Phase 6	Traffic using new west bound carriageway as single carriageway. Construct connecting roads over now disused A47, Remainder of approach ramps and east bound carriageway tie-ins completed. July 2023 to November 2023. Predominantly daytime works, overnights / 24 hour weekends required to complete A47 tie-ins	Earthworks Road Formation Structures Surfacing
Phase 7	Final tie-ins and finishing works. Overnight closures used as required to tie in new East bound carriageway. Followed by Lane 1/Lane 1 running on new carriageways to enable removal of temporary cross overs and completion of VRS. October 2023 to November 2023. Predominantly daytime works, Overnights required to complete RRS and removal of cross overs	Road Formation Surfacing
* Activities specific to each phase, in addition to earthworks, road formation, structures and surfacing activity associated with the continuity of offline construction.		

11.2. Noise sensitive receptors

11.1.2. A summary of a representative sample of the closest receptors to the construction works used in this assessment and their associated LOAEL (baseline noise level) and SOAEL levels are presented in Table 11-2 below and in Figure 11.1 (Noise location plan) (**TR010040/APP/6.3**). The LOAEL and SOAEL levels have been calculated from the 'Do-Minimum Opening Year' noise model, using the TRL Method 3 to convert $L_{A10,18hrs}$ to L_{night} .

Table 11-2: Sample of noise sensitive receptors and LOAEL and SOAEL levels

Receptor Reference	Address	LOAEL ($L_{Aeq,12hr}$) (dB)	SOAEL ($L_{Aeq,12hr}$) (dB)
R1	95A Yarmouth Road, Blofield, Norwich, NR13 4LQ	58	65
R2	97 Melai Yarmouth Road, Blofield, Norwich, NR13 4LQ	60	65
R3	109 Milestone Piece, Yarmouth Road, Blofield, Norwich, NR13 4LQ	58	65
R4	119 Hawthorns, Yarmouth Road, Blofield, Norwich, NR13 4LQ	58	65
R5	Owls Barn, Lingwood Road, Blofield, Norwich, NR13 4LL	49	65
R6	Violet Bank, Lingwood Road, Blofield, Norwich, NR13 4LL	49	65
R7	Sunny Acres, Yarmouth Road, Blofield, Norwich, NR13 4LH	61	65
R8	Sparrow Hall Bungalow, Yarmouth Road, Blofield, Norwich, NR13 4LH	59	65
R9	Brienz Waterlow, Blofield, Norwich, NR13 4LJ	52	65
R10	Kyrenia Waterlow, Blofield, Norwich, NR13 4LJ	51	65
R11	The Old Post Office, Norwich, Road North Burlingham, Lingwood And Burlingham, Norwich, NR13 4SU	69	75
R12	Hornbeam Cottage, Lingwood Road, North Burlingham, Lingwood And Burlingham, Norwich, NR13 4ST	56	65
R13	The Lindens, Lingwood Road, North Burlingham, Lingwood And Burlingham, Norwich, NR13 4ST	57	65
R14	4 Main Road, North Burlingham, Lingwood And Burlingham, Norwich, NR13 4TA	62	65
R15	18 Island House, Main Road, North Burlingham, Lingwood And Burlingham, Norwich, NR13 4TA	61	65
R16	31 Merton House, Main Road, North Burlingham Lingwood And Burlingham, Norwich, NR13 4TA	57	65
R17	Nelson Place, South Walsham Road, North Burlingham, Lingwood And Burlingham, Norwich, NR13 4EH	55	65
R18	Mustard House, Coxhill Road, North Burlingham, Beighton, Norwich, NR13 4EN	55	65
R19	The White House, Acle Road, North Burlingham, Beighton, Norwich, NR13 4EL	70	75

Receptor Reference	Address	LOAEL (L _{Aeq, 12hr}) (dB)	SOAEL (L _{Aeq, 12hr}) (dB)
R20	The Coach House, Acle Road, North Burlingham, Beighton, Norwich, NR13 4EL	54	65
R21	Beighton House, Acle Road, North Burlingham, Beighton, Norwich, NR13 4EL	54	65
R22	2 Hall Cottages, The Windle, Acle, Norwich, NR13 3JT	68	75
R23	27 Poplar Cottage, Lingwood Road, North Burlingham, Norwich, NR13 4ST	51	65

11.3. Construction Plant Assumptions

Table 11-3: Construction plant assumptions

Plant and equipment	No. of Plant	BS 5228 Ref.	% On time	SPL@10m (dB(A))	Sound pressure levels (SPL) octave band (Hz)								Assessment SWL (adjusted for No. Plant and % On time) (dB(A))
					63	125	250	500	1000	2000	4000	8000	
Earthworks													
Tracked excavator (40t)	2	C.2.14	80%	79	85	78	77	77	73	71	68	63	109
Wheeled excavator (18t)	2	C.4.10	80%	66	64	60	63	64	62	57	51	45	96
Articulated dump truck tipping fill (23t)	10	C.2.32	20%	74	80	76	73	70	69	66	63	58	105
Articulated dump truck drive by (23t)	10	C.2.33	20%	81	85	87	77	75	76	73	69	62	112
Dozer (28t)	2	C.2.11	60%	79	75	79	77	77	74	71	65	57	108
Vibrating roller (8.9t)	4	C5.20	60%	75	90	82	73	72	70	65	59	54	107
Diesel generator (7.5kW)	4	C4.87	80%	65	77	72	64	60	59	57	54	42	98
Tracked excavator (40t)	2	C.2.14	80%	79	85	78	77	77	73	71	68	63	109

Plant and equipment	No. of Plant	BS 5228 Ref.	% On time	SPL@10m (dB(A))	Sound pressure levels (SPL) octave band (Hz)								Assessment SWL (adjusted for No. Plant and % On time) (dB(A))
					63	125	250	500	1000	2000	4000	8000	
Total sound power level (SWL) during earthworks													115.9
Road Formation													
Dozer (28t)	4	C.2.11	80%	79	75	79	77	77	74	71	65	57	112
Tracked excavator (40t)	2	C.2.14	80%	79	85	78	77	77	73	71	68	63	109
Vibrating roller (8.9t)	2	C.5.20	60%	75	90	82	73	72	70	65	59	54	104
Diesel generator (7.5kW)	4	C.4.87	80%	65	77	72	64	60	59	57	54	42	98
Large rotary bored piling rig (110t)	1	C.3.14	50%	83	84	92	81	80	78	76	68	61	108
Total sound power level (SWL) during road formation													114.3
Structure formation													
Wheeled excavator (18t)	4	C.4.10	80%	66	64	60	63	64	62	57	51	45	99
Articulated dump truck drive by (23t)	5	C.2.33	20%	81	85	87	77	75	76	73	69	62	109
Concrete mixer truck (discharging) & concrete	2	C.4.28	20%	75	79	80	73	72	69	68	59	53	99

Plant and equipment	No. of Plant	BS 5228 Ref.	% On time	SPL@10m (dB(A))	Sound pressure levels (SPL) octave band (Hz)								Assessment SWL (adjusted for No. Plant and % On time) (dB(A))	
					63	125	250	500	1000	2000	4000	8000		
pump (pumping)														
Wheeled mobile crane (70t)	2	C.3.30	20%	70	80	72	71	67	65	62	57	49	94	
Diesel generator (15kW)	2	C4.86	80%	65	78	71	66	62	59	55	56	49	95	
Large rotary bored piling rig (110t)	1	C.3.14	50%	83	84	92	81	80	78	76	68	61	108	
Total sound power level (SWL) during formation of structures													110.1	
Surfacing														
Road roller (8.9t)	2	C.5.19	80%	75	90	82	73	72	70	65	59	54	105	
Vibratory roller (8.9t)	4	C.5.20	80%	75	90	82	73	72	70	65	59	54	108	
Asphalt paver (+ tipper lorry) (18t)	2	C.5.33	80%	75	82	82	78	72	69	67	61	54	105	
Wheeled excavator (18t)	2	C4.10	80%	66	64	60	63	64	62	57	51	45	96	
Dump Truck (tipping fill) (29t)	2	C.2.30	20%	79	85	74	78	73	73	74	67	63	103	
Lorry	5	C.2.34	20%	80	73	78	78	78	74	73	68	66	108	

Plant and equipment	No. of Plant	BS 5228 Ref.	% On time	SPL@10m (dB(A))	Sound pressure levels (SPL) octave band (Hz)								Assessment SWL (adjusted for No. Plant and % On time) (dB(A))
					63	125	250	500	1000	2000	4000	8000	
Diesel generator (7.5kW)	4	C4.87	80%	65	77	72	64	60	59	57	54	42	98
Total sound power level (SWL) during surfacing												113.4	
Utility Diversion													
Excavator (20t)	2	C2.21	80%	71	103	104	100	96	93	91	85	77	101
Dump Truck (10t)	2	C.2.32	60%	74	80	76	73	70	69	66	63	58	103
Sump pump	2	C4.88	100%	69	98	93	94	92	92	91	84	74	100
Generator	2	C4.85	100%	66	97	97	95	88	87	88	84	81	97
Total sound power level (SWL) during utility diversion												106.7	

11.4. Predicted construction noise levels

Table 11-4: Predicted construction noise levels at magnitude of impact at sensitive receptors (unmitigated)

Phase	Activity	Receptor Reference	Min. Distance (m)	Predicted façade noise $L_{Aeq,T}$ levels (dB)	Magnitude of impact (without mitigation)	
Compounds set up and utility diversions	Earthworks	R10	314	55	Minor	
		R15	112	65	Moderate	
		R17	210	60	Minor	
		R18	180	61	Minor	
		R20	45	68	Moderate	
		R21	115	64	Minor	
	Surfacing	R10	314	53	Minor	
		R15	112	63		
		R17	210	58	Negligible	
		R18	180	58	Minor	
		R20	45	66	Moderate	
		R21	115	62	Minor	
	Gas main diversion	R4	30	69	Moderate	
		R10	20	73	Major	
		R18	140	53	Negligible	
		R23	20	73	Major	
	Phase1	Earthworks	R8	100	67	Moderate
			R9	100	67	Moderate
R11			30	81	Major	
R12			35	81	Major	
R13			30	80	Major	
R14			75	70	Major	
R15			55	73	Major	
R17			270	56	Minor	
R18			150	63	Minor	
R20			100	65	Moderate	
R21			175	62	Minor	
Road Formation		R8	100	64	Minor	
		R9	100	65	Moderate	
		R11	30	77	Moderate	
		R12	35	79	Major	

Phase	Activity	Receptor Reference	Min. Distance (m)	Predicted façade noise $L_{Aeq,T}$ levels (dB)	Magnitude of impact (without mitigation)
		R13	30	78	Major
		R14	75	66	Moderate
		R15	55	71	Major
		R17	270	55	Minor
		R18	150	61	Minor
		R20	100	64	Minor
		R21	175	60	Minor
	Structures	R8	N/A	-	-
		R9	100	58	Minor
		R15	55	68	Moderate
		R17	270	51	Negligible
		R18	150	57	Minor
		R20	100	58	Minor
		R21	175	56	Minor
	Surfacing	R8	100	64	Minor
		R9	100	61	Minor
		R11	30	71	Minor
		R12	35	73	Major
		R13	30	74	Major
		R14	75	65	Moderate
		R15	55	70	Major
R17		270	54	Negligible	
R18		150	61	Minor	
R20		100	63	Minor	
R21		175	58	Minor	
Phase2	Earthworks	R4	65	62	Minor
		R5	250	57	Minor
		R7	90	63	Minor
		R8	120	61	Minor
		R9	120	58	Minor
	Road Formation	R4	65	60	Minor
		R5	250	55	Minor

Phase	Activity	Receptor Reference	Min. Distance (m)	Predicted façade noise $L_{Aeq,T}$ levels (dB)	Magnitude of impact (without mitigation)	
		R7	90	61	Negligible	
		R8	120	60	Minor	
		R9	120	56	Minor	
	Surfacing	R4	65	59	Minor	
		R5	250	53	Minor	
		R7	90	60	Negligible	
		R8	120	58	Negligible	
		R9	120	54	Minor	
	Phase3	Earthworks	R4	220	56	Negligible
			R6	270	56	Minor
R7			65	64	Minor	
R8			80	66	Moderate	
R9			155	59	Minor	
Road Formation		R4	220	54	Negligible	
		R6	270	54	Minor	
		R7	65	63	Minor	
		R8	80	64	Minor	
		R9	155	57	Minor	
Surfacing		R4	220	53	Negligible	
		R6	270	53	Minor	
		R7	65	64	Minor	
		R8	80	63	Minor	
		R4	220	56	Minor	
Phase4	Surfacing	R2	50	68	Moderate	
		R3	45	67	Moderate	
		R21	280	53	Negligible	
		R22	175	56	Negligible	
Phase5	Road Formation	R4	30	61	Minor	
		R6	260	54	Minor	
		R7	30	66	Moderate	
		R8	60	62	Minor	
		R9	135	55	Minor	

Phase	Activity	Receptor Reference	Min. Distance (m)	Predicted façade noise $L_{Aeq,T}$ levels (dB)	Magnitude of impact (without mitigation)	
		R18	290	53	Negligible	
		R19	8	74	Minor	
		R20	30	69	Moderate	
		R21	80	63	Minor	
	Surfacing	R4	30	60	Minor	
		R6	260	53	Minor	
		R7	30	65	Moderate	
		R8	60	61	Minor	
		R9	135	54	Minor	
		R18	290	52	Negligible	
		R19	8	73	Minor	
		R20	30	68	Moderate	
	Phase6	Earthworks	R4	60	58	Negligible
			R7	25	67	Moderate
R8			35	65	Moderate	
R9			210	56	Minor	
R15			20	59	Negligible	
R16			75	59	Minor	
R17			70	59	Minor	
R19			25	62	Negligible	
Road Formation		R4	60	56	Negligible	
		R7	25	65	Moderate	
		R8	35	63	Minor	
		R9	210	54	Minor	
		R15	20	58	Negligible	
		R16	75	57	Minor	
		R17	70	58	Minor	
		R19	25	59	Negligible	
Structures		R15	20	54	Negligible	
		R16	75	53	Negligible	
		R17	70	54	Negligible	
		R19	25	56	Negligible	

Phase	Activity	Receptor Reference	Min. Distance (m)	Predicted façade noise $L_{Aeq,T}$ levels (dB)	Magnitude of impact (without mitigation)
	Surfacing	R4	N/A	55	Negligible
		R7	N/A	64	Minor
		R8	N/A	62	Minor
		R9	N/A	53	Minor
		R15	20	57	Negligible
		R16	75	56	Negligible
		R17	70	57	Minor
		R19	25	59	Negligible
Phase7	Road Formation	R1	65	68	Moderate
		R2	50	69	Moderate
		R3	50	68	Moderate
		R21	275	54	Negligible
		R22	180	56	Negligible
	Surfacing	R1	65	67	Moderate
		R2	50	68	Moderate
		R3	50	67	Moderate
		R21	275	53	Negligible
		R22	180	48	Negligible

- 11.1.3. BS 5228-1 states that as a working approximation, a barrier between the source and the receiving provides an approximate attenuation of 5dB when the top of the plant is just visible to the receiver over the noise barrier, and of 10dB when the noise barrier completely hides the sources from the receiver. It also adds that specifically designed and positioned noise barriers could provide greater attenuation.
- 11.1.4. In order to mitigate potential moderate or major construction noise impacts at the receptors identified above, temporary noise barriers shall be erected where construction activity in the vicinity of the receptor will exceed 10 days or nights in any 15 consecutive days or nights; or for a total number of days exceeding 40 in any six consecutive months.
- 11.1.5. Well-designed noise barriers would provide a minimum of 10dB attenuation as commented above.

11.1.6. Once temporary mitigation in the form of noise barriers are considered, the receptors presenting potential moderate or major magnitude of construction noise impact are summarised below.

Table 11-5: Potential moderate or major magnitude of impact at sensitive receptors (mitigated)

Phase	Activity	Receptor Reference	Min. Distance (m)	Predicted facade noise $L_{Aeq,T}$ levels (dB)	Magnitude of impact (mitigated)
Phase1	Earthworks	R12	35	71	Major
		R13	30	70	Major
	Road Formation	R12	35	69	Moderate
		R13	30	68	Moderate